IEEE 802.4L
Through-the Air Physical Media, Radio
Running
Objectives and Directives
Document

This document provides a base for the discussions of the IEEE 802.4L Working Group.
Each decision will be marked in this document along with the reference to the motion on which the decision has been based (column Base) and with the reference of the document on which the present decision is based (Doc no).
After each meeting a new document will be prepared to reflect the decisions made at the meeting.

Subject	Base	Doc no

Scope

To define an alternative Physical Layer for Through-the-air communication, which is part of a local area network using 802.4 media access techniques and which is primarily for mobile environments.	PAR	4L/87-014

Purpose

To provide LAN access to moving automatic machines and other stations for which wireless attachment is appropriate. To add description of standards criteria for through-the-air transmission parameters to support Physical Layer Service. To prepare, if necessary, a petition to the FCC for rule making which authorizes use of radio spectrum for wireless LAN.	PAR	4L/87-014

Directions

System plan

The radio system plan for one community of users ~~shall be~~ dual frequency bus mode with head end independently of the number radiation sites used. The physical layer including the head end and radio system shall support the existing 802.4 MAC. (Among other things, this implies that when any station is transmitting, all stations must hear something.)	Jul 88	
For smaller systems the head-end requirement is withdrawn	Nov 88/4	4L/88-02
Whatever plan is evolved, it shall be suitable for use under current FCC part 15 regulations, in particular the three bands, 0.912 2.45, and 5.9 GHz.	Jul 88	

Modulation

We will consider modulation methods and bandwidths which are within the frequency allocation and spectral power density limits of FCC 15.126.	Jul 88	
Differential Phase Modulation shall be used.	Nov 88/1	4L/88-02
Direct Sequence Spread Spectrum shall be used.	Nov 88/2	4L/88-02
For the spreading sequence at least 10 and not more than 15 chips shall be used. This provides a processing gain of between 10 and 15 allowing frequency division multiplexing of co-located LANs	Nov 88/3	4L/88-02

Data Rate

The data rate for comparison purposes shall be 1 Mbit/s. We can only consider the IEEE data rates of 1, 5, 10, and 20 Mbit/s.	Jul 88	

Antenna

The design model shall assume an 16 antenna arrayed in a square grid. For purpose of analysis, it will be assumed that the antenna array is driven by one power splitter with equal length loss less cable from the splitter to each antenna.	Jul 88	

Bit Error Ratio

Since the radio medium is known to have a bit error rate of the order 10E-3 the system shall incorporate the level of diversity and forward error coding required to support the detected error rate of 10E-8 and undetected error rate of 10E-9.	Jul 88	

Subject	Base	Doc no

Outage

MAC protocol assumes the communication channel is always available. Since the radio medium is known to have an outage rate on the order of 10E-2, a method is required to reduce outage rate to less than 10E-5. — Jul 88

Directions

Speed Limits

20 mph normal, 30 mph max is 8.94 m/s to 13.4 m/s. If the limit for 2.45 GHz operation is 20 mph, then the limit velocities are as follows: — Jul 88

0.912 Ghz	53.7 mph
2.45 Ghz	20.0 mph
5.9 Ghz	8.3 mph

Definable parameters

XMTR power output:	+10 dBm (peak/average max.)	Jul 88
Mobile antenna gain:	+6 dB over isotropic	
Mobile antenna directivity:	2x45° B.W. OMNI, (CP?)	
Receiver noise figure:	6 dB at 900	
	8 dB at 2400	
	10 dB at 5900 Mhz	

Error correction codes:

Allowable overhead:	1.5x	Jul 88
Suggestion:	BCH 31,21?	
(Read Solomon or Golay codes may be more appropriate)		
Spectral efficiency:	4 Hz/bit	
Propagation:	6 dB/octave under 10 meters	
	11 dB/octave over 10 meters	
	+20 dB margin.	
S/N minimum:	?	
Fading:	?	

Discussions:

The antenna probably needs to be a circularly polarized omni directional in the horizontal plane 22.5t. — Jul 88

Antenna

Expect a 6 dB per octave reduction in noise floor allows thermal noise assumption, also, if the antenna is located 7 to 10 feet above ground it has 25 dB antenna gain over an antenna in a pocket. — Jul 88

MEETING PLAN

Type	Dates	Place	Objective
Interim	Jan 16,89 1 PM - Jan 18, 2 PM	Chicago (IL) O'Hare, Hyatt	Medium Characteristics Program of Work
		Venue information in doc IEEE 802.4L/88-05	
Plenary	Mar 20-24, 89 2 half days	New Orleans	Medium Characteristics Document Lay-out
Interim	May 1- 3, 89	Netherlands	Prepare first draft
Plenary	Jul 10-14, 89	Vancouver	Draft 1 to 802.4
Interim	Sep 4- 6, 89	?	Next draft
Plenary	Nov 6-10, 89	Ft Lauderdale	Draft 2 to 802.4
Interim	Jan - , 90	?	Next draft
Plenary	Mar 12-16, 90	Newport Beach	802.4 Voting draft
Interim	May - , 90	?	Prepare TCCC draft
Plenary	Jul 9-13, 90	Denver (CO)	TCCC voting draft
Interim	Sep - , 90	?	Last comment
Plenary	Nov 12-16, 90	Phoenix	Final Draft out

IEEE 802.4L--THROUGH-THE-AIR TOKEN BUS MEDIUM ACCESS

MEETING CANCELLATION NOTICE

TUESDAY FEBRUARY 2, 1988

CHICAGO O'HARE (AIRPORT) HILTON HOTEL AT 0900

January 15, 1988

Due to lack of indication of attendance and contributions, the meeting referenced above is **cancelled**. The next regular meeting, concurrent with the 802 Plenary, will be held as usual.

David Greenstein, Chairman

Chandos Rypinski, Secretary

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